



Imprisoned knowledge: Criminals' beliefs about deception

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Purpose. This paper is a survey examining beliefs about cues to deception held by prison inmates, prison personnel and students. In line with the ideas about more beneficial learning structures in the environment of criminals and findings from previous studies, we predicted that the beliefs held by prison inmates would be most consistent with the general pattern found in studies examining objective cues to deception.

Method. A total of 326 participants filled out a questionnaire containing questions about cues to deception. The sample consisted of 107 prison inmates from high-security prisons, 103 prison personnel and 116 students. Both between-group and within-group analyses were conducted.

Results. In line with previous surveys, students and prison personnel held stereotypical and wrongful beliefs about cues to deception. Prison inmates' beliefs about deception were less stereotypical than the beliefs of prison personnel and students.

Conclusions. The results indicate that prison inmates have relatively more insight into the psychology of deception. A reasonable explanation for these findings is that the environment of criminals is beneficial in the sense that they receive more adequate outcome feedback than the other two groups. The results indicate that studying this group may generate useful knowledge about the dynamics of deception.

Being able to accurately distinguish between truthful and deceptive statements is important in a range of situations, although the consequences of inaccurate judgments differ between contexts. In the legal field, the consequences of such misjudgments of veracity can be very serious. Therefore, in certain contexts such as the legal field, the ability to correctly detect lies is of the utmost importance.

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Research on deception detection ability has repeatedly shown that people are generally not very good at distinguishing between truthful and deceptive statements. In most studies, accuracy rates fall below 60% (Kraut, 1980; Vrij, 2000). This performance level is not impressive, considering that an accuracy rate of 50% is expected by chance alone. One commonly proposed explanation is that there is lack of overlap between the cues research has shown to be associated with deception (objective cues to deception) and the cues people believe to be associated with deception (subjective cues to deception) (Vrij, 2000).

Meta-analyses on nonverbal differences between liars and truth tellers have identified only a few reliable objective cues to deception. With regard to vocal characteristics (behaviours related to speech and voice), liars tend to have a higher pitched voice and make longer pauses than truth tellers. Only a few nonvocal behaviours seem to be systematically related to deception, indicating that liars are more tense (DePaulo *et al.*, 2003) and make fewer leg/foot and hand/arm movements (DePaulo, 1992; Sporer & Schwandt, 2002; Vrij, 2000; Zuckerman, DePaulo, & Rosenthal, 1981). As for verbal differences between liars and truth tellers, liars tend to tell less plausible stories, include more negative statements, and give more indirect and less detailed answers (DePaulo *et al.*, 2003).

Research on subjective indicators of deception has shown that people associate deception with more speech disturbances (such as hesitations and speech errors), a slower speech rate, longer and more frequent pauses, more gaze aversion, and an increase in smiling and movements such as self-manipulations, hand/finger and leg/foot movements (Vrij, 1998). Generally, these subjective cues to deception are indicators of nervousness. It may be the case that people believe that a liar will feel nervous and act accordingly; however, not all liars feel nervous or act nervously (Köhnken, 1989; in Vrij & Semin 1996). Searching for and using cues indicating nervousness when judging veracity means falling prey to the representativeness heuristic (Stiff *et al.*, 1989). This is a rule of thumb used for making judgments which assume that a given sample is representative of the larger population from which it is drawn (Nevid, 2003). In other words, because people tend to believe that liars are more nervous than truth tellers, they infer deception from signs of nervousness.

Taken together, the results from research on objective and subjective cues to deception thus suggest that there is a mismatch between cues actually associated with deception and cues people associate with deception. This mismatch may partly account for people's poor lie detection performance.

Experts' beliefs

The vast majority of studies investigating people's beliefs about cues to deception have been conducted with college students as participants (Vrij, 2000). It may be plausible to suggest that professional lie detectors, such as police officers, judges and customs officers, have beliefs about cues to deception that are more in tune with objective cues. This possibility has been explored in the U.K. (Akehurst, Köhnken, Vrij, & Bull, 1996, examining beliefs regarding both nonverbal and verbal cues to deception), the Netherlands (Vrij & Semin, 1996, examining only nonverbal behaviour) and Sweden (Strömwall & Granhag, 2003, examining beliefs about verbal and nonverbal cues to deception as well as the effect of some situational factors; Granhag, Strömwall, & Hartwig, 2003, examining the beliefs about verbal and nonverbal cues to deception and cross-cultural aspects of deception). These surveys of experts' beliefs contrasted police officers and students (Akehurst *et al.*, 1996), students, prisoners and

professional lie detectors (police officers, customs officers, prison guards and patrol police officers; Vrij & Semin, 1996); police officers, prosecutors and judges (Strömwall & Granhag, 2003), and finally students and Migration Board officers handling asylum cases (Granhag *et al.*, 2003). The results from these surveys on subjective cues to deception show that the beliefs are highly similar for experts and lay people (college students). Furthermore, the converging evidence is that experts also consider nervous behaviours to be indicative of deception (Vrij, 2000). The indicator that experts and lay people alike most rely upon is a decrease in eye contact when lying, which is not a reliable predictor (DePaulo *et al.*, 2003). These studies therefore suggest that presumed experts hold the same stereotypical beliefs about cues to deception as lay people.

One explanation that has been proposed to account for the stereotypical beliefs of presumed lie experts is a lack of feedback. The notion of the importance of outcome feedback on veracity judgments (henceforth referred to as the feedback hypothesis) suggests that mere experience of judging veracity is not enough to improve lie detection accuracy (DePaulo & Pfeifer, 1986; Ekman & O'Sullivan, 1991; Vrij, 2000; Vrij & Semin, 1996). DePaulo, Stone, and Lassiter (1985; in DePaulo & Pfeifer, 1986) suggested that feedback is often inadequate and unsystematic in occupations where lie detection is a central task. One example of such an occupational group is customs officers, who do not always find out whether their decisions were correct; they get no feedback at all from travellers whom they decide not to search. Einhorn (1982) stressed the importance of feedback on learning from experience, but pointed out that positive feedback can actually hamper the learning of valid decision-making rules by undermining people's motivation to investigate exactly how the success was achieved. If a customs officer finds that the traveller he decided to search did indeed smuggle goods, he may regard this as a validation of his theories about the relation between verbal and nonverbal behaviour and deception. In fact, it may be the case that the officer relied on the wrong cues, and that managing to catch a smuggler was pure coincidence. The customs officer may also have relied on cues without any conscious awareness. In cases like this, erroneous beliefs can be cemented rather than corrected through experience. For feedback to be helpful in developing accurate decision-making rules, it thus has to be frequent and reliable, and preferably immediate (Allwood & Granhag, 1999; Einhorn, 1982). See also Hogarth (2001) for an extensive discussion on different types of learning structures, which has direct bearing on this issue.

A study investigating the effect of feedback on lie detection accuracy (Zuckerman, Koestner, & Alton, 1984) showed that the more information participants received about the veracity of the targets, the more accurate they were in detecting deception in these targets. However, this increase in accuracy did not generalize to other targets, indicating that a target-specific lie-detection ability was evolved due to the provision of feedback.

More recently, a test of the effect of feedback and cue information on deception detection accuracy was conducted (Porter, Woodworth, & Birt, 2000). Results from this study showed that receiving immediate and reliable outcome feedback had a positive effect on lie detection accuracy, even if no information about reliable cues to deception was available. A possible interpretation of this finding is that even though no information about valid cues to deception was provided, feedback made the lie detectors gradually learn reliable cues to deception.

Are there any groups of persons that are provided with feedback regularly and hence have more accurate beliefs about cues to deception? The idea that criminals ought

to be better equipped in this sense was proposed and tested by Vrij and Semin (1996). Speculatively, criminals live in a more deceptive culture than most other people, something that may make them aware of deceptive strategies that work. The environment in which criminals live may also demand a general alertness in order not to be deceived; this could lead to a less pronounced truth bias and a more realistic perception of the frequency of deception. Moreover, being interrogated on repeated occasions and thus receiving feedback on deception success and failure might also increase knowledge about which deceptive strategies are useful in convincing others.

Indeed, results from the study conducted by Vrij and Semin (1996), although using a rather small sample, lend some support to this view by indicating that prison inmates had a better notion about the relationship between nonverbal behaviour and deception, compared with other presumed lie experts (customs officers, police detectives, patrol police officers and prison guards) and lay people (college students).

The environment of prison personnel

It may be plausible to suggest that prison personnel get more feedback in their professional lives than most other presumed lie experts. For example, upon suspicion that an inmate possesses forbidden goods such as drugs, prison personnel can search the inmate or his cell, and thus find out whether the suspicion was warranted. Moreover, after deciding on whether a certain inmate should get leave, prison personnel have the chance of receiving feedback on the appropriateness of that decision, with the help of information about the inmate's behaviour during that leave. Hence, we believe that this group may have less stereotypical beliefs about deception than lay people.

The present study

Three groups were included in the present study. Prison inmates were chosen because it was argued that they may have the opportunity to receive more adequate feedback than most other groups. Prison personnel were included on the basis of their frequent interaction with prison inmates, and due to the fact that they work in a milieu where a general alertness to deception is demanded and where some feedback is possibly available. Students were included to represent lay people. This study set out to explore four main issues. First, to examine the beliefs about cues to deception held by prison inmates, prison personnel and college students. Second, to compare the beliefs of these groups with each other in order to identify between-group differences. Third, to match the beliefs of the three groups with findings from studies investigating objective cues to deception. Fourth, to examine the degree of within-group agreement about cues to deception.

Eleven items concerning both verbal and nonverbal aspects of deception were included in the questionnaire: (1) number of details, (2) consistency of consecutive statements, (3) gaze behaviour, (4) body movements, (5) pitch of voice, (6) duration of pauses, (7) whether verbal or nonverbal cues are more reliable, (8) the effect of planning verbal behaviour on deception success, (9) the effect of planning nonverbal behaviour on deception success, (10) whether liars find it easier or more difficult to tell their story backwards, and (11) whether lying or telling the truth requires more mental effort. There were three main reasons for including these items. First, some items were chosen because they have been shown to be related to deception (e.g. pitch of voice, body movements) and we were interested in whether the participants

were aware of these relationships (DePaulo *et al.*, 2003). Second, some items were chosen because research has shown that people often associate them with deception (e.g. gaze aversion, consistency), and we wanted to investigate whether the participants in this study did so (Vrij, 2000). Third, some items were chosen because they concerned strategies for deceiving or for detecting deception (e.g. telling the story backwards, planning verbal and nonverbal behaviour) which are important, but have been neglected in previous research (DePaulo *et al.*, 2003).

Our main prediction was that the beliefs of prison inmates would be more in tune with objective cues to deception than would the beliefs of the two other groups. However, we predicted that prison personnel would have less stereotypical beliefs about cues to deception than students, because we believe that prison personnel have the opportunity to receive some outcome feedback in the environment of their professional life. In line with previous research, we expected that students would subscribe to stereotypical beliefs about liars' behaviour often found in studies investigating subjective cues to deception (e.g. Akehurst *et al.*, 1996; Strömwall & Granhag, 2003).

Items not concerned with cues to deception (planning of verbal and nonverbal behaviour, telling the story backwards, and mental effort) were included either because of their relevance to strategies for deceiving (the three first items) or because of the impact on the detection of deception (the fourth item). To our knowledge, no previous study has included these items. For these items, we had three separate predictions. First, it has been suggested that it is easier to tell a lie when one has had the opportunity to prepare and plan the lie in advance (Vrij, 2000). We believed that all groups would express the belief that planning both verbal and nonverbal behaviour is beneficial for lie success, but that prison inmates would believe so to a greater extent because of the experience of lying we assume they have. Second, we did not expect our participants to be experienced in telling stories backwards (independent of whether lying or telling the truth). However, it can be argued that most people will believe that lies, which often are planned and rehearsed in order to conform to narrative conventions, will be more difficult to tell backwards than true stories. Finally, in line with the content complexity approach (Vrij, 2000) suggesting that lying can be a cognitively demanding task (e.g. having to come up with plausible answers, avoiding contradictions), we predicted that all groups would find lying more mentally effortful than telling the truth, but that prison inmates would consider lying to be less mentally effortful than would prison personnel and students, as we believe that they have more extensive experience of lying. In support of this idea, Norwick, Kassin, Meissner, and Malpass (2002) reported that inmates, on demand and with little or no time for preparation, managed to produce very convincing false confessions.

Method

Participants

Questionnaires from 326 participants were obtained and analysed. The sample consisted of 107 prison inmates (mean age 35.0 years, all male) 103 prison personnel (mean age 40.2 years, 45 women, 51 men) and 116 students (mean age 26.9 years, 78 women, 38 men).

The prison inmate sample was obtained from three Swedish high-security prisons where people were imprisoned for serious crimes such as murder, rape and armed robbery. The prison personnel came from five prisons in Sweden, and the students came from various departments at Göteborg University. Prison personnel and prison

inmates were approached via a contact person at each prison, who distributed the questionnaires to the participants. It is not possible to calculate a meaningful response rate, as the questionnaires were not handed out to every prison inmate and prison personnel at the prisons. Instead, those who were interested in participating filled out the questionnaire. For students, questionnaires were distributed during class to volunteers. No reward was given to any of the participants.

The questionnaire

On the basis of previous research on deception detection, 11 items were identified and included in the questionnaire. For each item, participants indicated their opinion on forced-choice answer scales with four alternatives. Respondents could choose between two directed (e.g. 'liars include fewer details than truth tellers' and 'liars include more details than truth tellers') and one neutral (e.g. 'there is no difference in the amount of details given by liars and truth tellers') alternative. A 'don't know' alternative was also available. The included items and the directed answer alternatives are given in Table 1.

The participants also answered questions regarding background characteristics. All questionnaires were completed anonymously. In order to protect the anonymity of the prison inmates, we refrained from including questions about their criminal history.

Results

Here, we first present analyses of how often the participants chose the 'don't know' answers. The results of analyses of differences between and within the investigated groups are then presented.¹

Distribution of 'don't know' answers

Chi-square tests were conducted in order to investigate whether the investigated groups chose the 'don't know' alternative to different extents. The answer alternatives were recoded so that 1 indicated taking a stand (the directed and neutral alternatives) and 0 indicated 'don't know'. Six of the 11 chi-squares were significant; Details [$\chi^2(2, N = 323) = 9.72, p < .01$], Body movements [$\chi^2(2, N = 325) = 9.08, p < .05$], Pitch of voice [$\chi^2(2, N = 324) = 6.80, p < .05$], Duration of pauses [$\chi^2(2, N = 324) = 11.08, p < .01$], Verbal vs. nonverbal cues [$\chi^2(2, N = 325) = 11.08, p < .01$] and Mental effort [$\chi^2(2, N = 325) = 8.48, p < .05$]. For Details, Body movements, Pitch of voice and Duration of pauses, the students chose the 'don't know' alternative more often than did prison personnel, who chose the 'don't know' alternative more often than did prison inmates. For Verbal vs. nonverbal cues and Mental effort, the patterns were the opposite, that is, prison inmates chose the 'don't know' alternative more often than did prison personnel, who chose 'don't know' more often than did students. The distributions of answers for all items are given in Table 2.

Between-group comparisons

To allow for group comparisons, the three first answer alternatives were recoded as 1, 0 or -1 (see Table 3 for details). The 'don't know' alternative thus was excluded from

¹In order to rule out the possibility that the observed between- and within-group differences could be explained by the sex or age of the respondent, we conducted analyses of the effects of these two variables. These analyses revealed differences between men and women in only 5 of 22 possible instances. For age, in only 3 of 33 possible instances, did differences between the age groups emerge.

Table 1. Items included in the questionnaire, given answer alternatives and correct answers

Item	Negative Alternative (-1)	Positive Alternative (1)	Correct Answer According to Research ^a
Details	Deceptive statements contain <i>fewer</i> details than truthful ones.	Deceptive statements contain <i>more</i> details than truthful ones.	Negative alternative.
Consistency	Consecutive deceptive statements are <i>less</i> consistent than truthful ones.	Consecutive deceptive statements are <i>more</i> consistent than truthful ones.	Neutral alternative.
Gaze behaviour	Liars look their conversational partner in the eyes <i>less</i> than do truth tellers.	Liars look their conversational partner in the eyes <i>more</i> than do truth tellers.	Neutral alternative.
Body movements	Liars move <i>less</i> than truth tellers.	Liars move <i>more</i> than truth tellers.	Negative alternative.
Pitch of voice	Liars' pitch is <i>lower</i> than truth tellers.	Liars' pitch is <i>higher</i> than truth tellers.	Positive alternative.
Pauses	Liars make <i>shorter</i> pauses than truth tellers.	Liars make <i>longer</i> pauses than truth tellers.	Positive alternative.
Verbal vs. nonverbal cues	<i>Nonverbal</i> behaviour is more reliable when judging truthfulness.	<i>Verbal</i> behaviour is more reliable when judging truthfulness.	Research results are inconclusive.
Planning deceit, verbal	Planning of deceptive statements <i>decreases</i> impressions of honesty.	Planning of deceptive statements <i>increases</i> impressions of honesty.	Positive alternative.
Planning deceit, nonverbal	Planning of nonverbal behaviour <i>decreases</i> impressions of honesty.	Planning of nonverbal behavior <i>increases</i> impressions of honesty.	Positive alternative.
Telling story backwards	It is <i>easier</i> for liars than truth tellers to tell their story backwards.	It is <i>more difficult</i> for liars than truth tellers to tell their story backwards.	Research is lacking.
Mental effort	It takes <i>less</i> mental effort to lie than to tell the truth.	It takes <i>more</i> mental effort to lie than to tell the truth.	Research results are inconclusive.

Note. For each item, there was also a neutral answer alternative (e.g. there is no difference in the amount of detail given by liars and truth tellers) as well as a "don't know" alternative.

^aSee, for example, DePaulo et al. (2003) and Vrij (2000).

Table 2. Percentage distribution of chosen alternatives within each group

Item	Students				Prison personnel				Prison inmates			
	Negative	No difference	Positive	Don't know	Negative	No difference	Positive	Don't know	Negative	No difference	Positive	Don't know
Details ^a	25.0	14.7	46.6	13.8	25.7	17.8	54.5	2.0	27.4	15.1	46.2	11.3
Consistency ^b	62.1	3.4	25.9	8.6	56.4	10.9	18.8	13.9	32.1	21.7	26.4	19.8
Gaze ^b	49.1	19.8	20.7	10.3	57.3	21.4	18.4	2.9	41.9	33.3	16.2	8.6
Body movements ^b	12.9	15.5	51.7	19.8	12.7	22.5	58.8	5.9	16.8	38.3	29.0	15.9
Pitch of voice ^c	16.4	26.7	30.2	26.7	20.6	29.4	37.3	12.7	17.9	38.7	24.5	18.9
Pauses ^d	37.9	11.2	14.7	36.2	55.9	11.8	14.7	17.6	21.7	27.4	29.2	21.7
Verbal/nonverbal ^e	25.9	59.5	8.6	6.0	31.1	44.7	23.3	1.0	14.2	35.8	37.7	12.3
Planning verbal ^f	12.1	11.2	71.6	5.2	18.6	13.7	57.8	9.8	15.9	13.1	57.0	14.0
Planning nonverbal ^f	23.3	7.8	50.9	18.1	19.4	14.7	43.1	12.7	15.9	15.0	49.5	19.6
Telling story backwards ^g	9.5	9.5	73.3	7.8	15.7	8.8	68.6	6.9	16.8	15.9	51.4	15.9
Mental effort ^b	1.7	3.4	87.1	7.8	6.9	7.8	82.4	2.9	15.9	18.7	51.4	14.0

Notes. The negative alternative indicates ^aFewer when lying, ^bLess when lying, ^cLower when lying, ^dShorter when lying, ^eNonverbal cues more reliable, ^fLess is better, ^gEasier when lying.

Table 3 Between-group differences in beliefs about the items

Item	Minus sign indicates	Students	Prison personnel	Prison inmates	χ^2 -value ^a
Details	Fewer when lying	.25 _a	.29 _a	.21 _a	0.37
Consistency	Less when lying	-.40 _a	-.44 _a	-.07 _b	11.58**
Gaze	Less when lying	-.32 _a	-.40 _a	-.28 _a	1.76
Body movements	Less when lying	.48 _a	.49 _a	.14 _b	15.94***
Pitch of voice	Lower when lying	.19 _a	.19 _a	.08 _a	1.43
Pauses	Shorter when lying	-.36 _a	-.50 _a	.10 _b	24.99***
Verbal/nonverbal	Nonverbal cues more reliable	-.18 _a	-.08 _a	.27 _b	21.93***
Planning verbal	Less is better	.63 _a	.43 _a	.48 _a	3.62
Planning nonverbal	Less is better	.34 _a	.16 _a	.42 _a	4.04
Telling story backwards	Easier when lying	.69 _a	.57 _{ab}	.41 _b	7.89*
Mental effort	Less when lying	.93 _a	.78 _a	.41 _b	39.39***

Notes. Means with different subscripts differ significantly by the Mann-Whitney test with a family wise error rate controlled by the Dunn-Šidák procedure, $p \leq .017$.

^aChi-square values resulting from Kruskal-Wallis analysis of variance ($df = 2$).

* $p < .05$; ** $p < .01$; *** $p < .001$.

the between-group analyses. In Table 3, the results of Kruskal-Wallis analyses of variance and Mann-Whitney post-hoc tests are presented.

Details

All three groups believed that deceptive statements contain more details than truthful statements. There were no significant between-group differences for this item.

Consistency

All groups indicated that deceptive statements are less consistent over time than are truthful ones. However, prison inmates believed so significantly less than the other two groups. In other words, prison inmates were significantly less convinced that truthful statements are more consistent than deceptive ones.

Gaze behaviour

All groups believed that liars are more gaze averse than truth tellers. Prison personnel were most convinced, whereas prison inmates were least convinced, but these between-group differences were not significant.

Body movements

All groups expressed the belief that liars exhibit more body movements than truth tellers; but the belief of prison inmates was significantly weaker. In other words, prison inmates believed to a significantly lesser extent than the other groups that liars exhibit more body movements than truth tellers.

Pitch of voice

All three groups expressed a rather weak belief that the pitch of the voice is higher when lying compared with when telling the truth. No significant between-group differences were found.

Duration of pauses

Prison personnel and students believed quite strongly that liars make shorter pauses than truth tellers. Prison inmates, however, expressed a weak belief in the opposite

direction; in other words, that liars make longer pauses than truth tellers. This between-group difference was significant.

Verbal vs. nonverbal cues

Prison personnel and students expressed the belief that nonverbal cues are a more reliable indicator when judging veracity. Prison inmates believed the opposite, namely, that verbal cues are more reliable; the difference between the beliefs of prison personnel and students, on the one hand, and prison inmates, on the other hand, was significant.

Planning deceit, verbal

All groups subscribed to the belief that planning verbal behaviour enhances deception performance. There were no significant between-group differences, although the beliefs of students were slightly stronger than those of the other two groups.

Planning deceit, nonverbal

All the investigated groups expressed a belief that planning nonverbal behaviour enhances deception performance. The beliefs of prison personnel were the weakest, whereas the beliefs of prison inmates were strongest; however, these differences were not significant.

Telling story backwards

All groups believed that it is easier to tell a truthful story backwards than it is to tell a deceptive story backwards. Students expressed a significantly stronger belief than prison inmates, whereas prison personnel expressed an intermediately strong belief and did not differ from either students or prison inmates.

Mental effort

Students and prison personnel expressed a strong belief that lying takes more mental effort than truth telling; prison inmates expressed a belief in the same direction, but significantly less strongly.

Within-group analyses

In order to investigate the extent to which the group agreed on each item, a cut-off point of 80% was set (cf. Kassin, Ellsworth, & Smith, 1989). In other words, if 80% of a group's members chose the same alternative (either alternative 1, 2 or 3), the group was considered to agree on that item. The results of the within-group analyses are summarized in Table 4.

Mental effort

The students agreed to a very large extent (94.4%) that it takes more mental effort to lie than to tell the truth. There was also a high degree of consensus among prison personnel (84.8%) in choosing this alternative. Prison inmates, however, failed to show such high within-group agreement; 59.8% chose the alternative that it takes more mental effort to lie than to tell the truth.

For all other items, within-group agreement was below 80%. To sum up, the analyses of within-group agreement revealed a very high level of disagreement within the investigated groups. In only 2 of 33 possible instances, was consensus found among the participants.

Table 4. Within-group percentage share for the most often expressed belief for each item

Item	Students	Prison personnel	Prison inmates
Details	54.0	55.6	52.1
Consistency	67.9	65.5	40.0
Gaze behaviour	54.8	59.0	45.8
Body movements	64.5	62.5	45.6
Pitch of voice	41.2	42.7	47.7
Pauses	59.5	67.9	37.3
Verbal vs. nonverbal cues	63.3	45.1	43.0
Planning deceit, verbal	75.5	64.1	66.3
Planning deceit, nonverbal	62.1	49.4	61.6
Telling story backwards	79.4	73.7	61.1
Mental effort	94.4	84.8	59.8

Notes. Italics indicate within-group agreement. The 'don't know' alternative was excluded from the analyses.

Discussion

The present study focused on beliefs about deception held by prison inmates, prison personnel and college students. The study sought to explore four main issues. The first issue was to investigate which belief the three groups held about cues to deception. The second was to compare the beliefs of the three groups in order to detect between-group differences. The third issue was to compare the beliefs of the groups with research on cues to deception. The fourth was to investigate the extent to which group members agreed with each other.

Deception beliefs and matching with research

Details

All groups expressed the belief that deceptive statements contain more details than truthful ones; a quite surprising finding. To our knowledge, no other study on subjective indicators of deception has reported this pattern. Instead, people often seem to believe the opposite, that deceptive statements contain fewer details (Akehurst *et al.*, 1996; Strömwall & Granhag, 2003). Indeed, nine of eleven experimental studies on objective cues to deception (summarized by Vrij, 2000), as well as a recent meta-analysis (DePaulo *et al.*, 2003), report that deceptive statements contain fewer details than truthful ones. However, the relation between deception and number of details may in fact be less clear than these results indicate. In none of the experimental studies were adjustments made for the number of words in the statements. Deceptive statements have been shown to contain fewer words than truthful ones; hence there may be a confounding between the number of words spoken and the absolute number of details (Strömwall & Granhag, 2003).

One speculative explanation is that the three groups believe that liars include more details in order to make the statement appear more credible. Possibly, they reason that by including more details, a liar manages to make the impression that he is talking about a self-experienced event. Indeed, this idea is supported by the fact that all groups

seemed to believe in the benefit of planning verbal behaviour when wanting a lie to go unnoticed.

Consistency

All groups believed that deceptive statements are less consistent than truthful ones; this belief is in line with previous research on experts' beliefs (Akehurst *et al.*, 1996; Strömwall & Granhag, 2003). Prison inmates, however, differed from prison personnel and students in that they expressed a weaker belief. The distribution of prison inmates' answers on this item reveals a high degree of disagreement as to which answer is more correct. Research has indicated that deceptive consecutive statements are at least as consistent as truthful ones (Granhag & Strömwall, 2002; Granhag, Strömwall, & Jonsson, 2003). For this item, prison inmates thus seemed to hold a less stereotypical belief than prison personnel and students.

Gaze behaviour

All groups indicated that liars are more gaze averse than truth tellers, and there was no between-group difference in this belief. This belief is frequently found in surveys focusing on subjective cues to deception (e.g. Granhag *et al.*, 2003; Strömwall & Granhag, 2003; Vrij & Semin, 1996). Notably, however, was that 33.3% of the prison inmates expressed the belief that there was no difference in gaze behaviour between liars and truth tellers (the corresponding figures for prison personnel and students were 21.4 and 19.8%, respectively). Research has shown that gaze aversion is not consistently related to deception (DePaulo *et al.*, 2003; Vrij, 1998).

Body movements

All groups expressed the belief that there is an increase in body movements during deception, but prison inmates believed so to a lesser extent than prison personnel and students. For prison inmates, the most frequently chosen answer alternative was that there are no differences in body movements between liars and truth tellers; whereas for prison personnel and students the by far most frequent answer was that liars exhibit more body movements. In this respect, prison inmates thus differed both from the two other groups investigated in this study, and from the common pattern resulting from studies on subjective cues to deception (e.g. Granhag *et al.*, 2003; Strömwall & Granhag, 2003). A number of studies on objective cues to deception have shown that liars in fact often move less than truth tellers (DePaulo *et al.*, 2003; Sporer & Schwandt, 2002; Vrij, 2000).

Pitch of voice

All groups indicated weakly that the pitch of the voice is higher when lying than when telling the truth. However, all groups exhibited rather even distributions of the answer alternatives. For prison inmates, the most frequent answer was 'no difference', whereas this alternative was the second most frequent for prison personnel and students. Considering the even distribution of answer alternatives, the groups seemed to disagree to a high extent as to which answer alternative was correct. Research has consistently shown that liars have a somewhat higher pitch of voice than truth tellers, possibly because of stress (Vrij, 2000).

Duration of pauses

Prison personnel and students believed that liars make shorter pauses than do truth tellers, whereas prison inmates expressed a weak belief that liars make

longer pauses. An overview by Vrij (2000) shows that liars make longer pauses than do truth tellers. For this item, prison inmates thus held a less stereotypical belief than prison personnel and students.

Verbal vs. nonverbal cues

Prison personnel and students indicated that nonverbal cues are more reliable than verbal cues when detecting deception. Prison inmates, however, expressed a belief in the opposite direction. Research has indicated that lie-detectors relying on verbal cues tend to achieve higher accuracy scores in detecting lies than those relying on nonverbal cues (Vrij, 2000). However, studies investigating the accuracy obtained when relying on verbal cues to deception have often used presumed lie experts as judges, whereas studies focusing on the accuracy obtained when relying on nonverbal cues have most often used lay persons as judges. Therefore, there is no clear pattern as to which cues (verbal or nonverbal) are more reliable when facing the task of distinguishing between truthful and deceptive statements.

Planning deceit, verbal and nonverbal

All three groups expressed the belief that planning verbal and nonverbal behaviour is beneficial when one wants to be successful at lying. Research findings have indicated that planning decreases the number of speech hesitations and speech errors; importantly, observers associate many speech errors and hesitations with deception (Vrij, 2000). In other words, there are reasons to believe that planning may in fact be beneficial when one wants a lie to go unnoticed.

Telling story backwards

All groups expressed a belief that it is easier to tell a truthful story backwards than it is to tell a deceptive story backwards. Students believed so to a higher degree than did prison inmates. Research is lacking on this issue, thus it is unclear whether truthful or deceptive statements are easier to tell backwards (if there is any difference at all). Empirical inquiries into this matter would help to clarify the relation between deception and telling a story backwards.

Mental effort

Both prison personnel and students believed strongly that lying is a mentally more effortful task than telling the truth. Prison inmates expressed the same belief, but the belief was weaker. The content complexity approach suggests that telling a fabricated story is more cognitively complex and therefore more mentally effortful (Vrij, 1998). However, this is not always the case; telling a well-planned and simple lie may be as easy as telling the truth (Vrij, 2000). McCornack (1997) argues that whether telling lies or truths is more mentally effortful is determined to a large extent by the context in which the communication occurs. For situations in which the message to be communicated is not potentially damaging, telling the truth might be less demanding than lying. By contrast, when the information relevant for disclosure contains some potentially damaging content, it might be less mentally effortful to lie as one does not then need to be concerned with how to frame the possibly upsetting information, one only needs to conceal this information.

A recent survey study conducted by Vrij and Taylor (2003) showed that both police officers and students considered that trivial and serious lies differ in the amount of mental effort they demand, with serious lies being more mentally effortful to tell than trivial ones.

The feedback hypothesis

It was hypothesized that prison inmates would express beliefs about deceptive behaviour that are more in tune with research findings about objective cues to deception than would lay people. Taken together, the results from the present study suggest that prison inmates, when considered as a group, do hold different beliefs about cues to deception than do prison personnel and college students, and that the beliefs held by prison inmates are less stereotypical than those of prison personnel and students. Importantly, the beliefs of the prison inmates differ from those of the other groups on items such as consistency (Greuel, 1992) and body movements (Vrij, Edward, & Bull, 2001), which have been shown to be central (both as subjective and objective cues) for, among others, police officers when judging veracity. However, contrary to our prediction, prison personnel held beliefs about deception very similar to those of students. A possible explanation for this finding is that the environment of the prison personnel may not contain enough feedback to make them alter their stereotypical beliefs about deception.

The feedback hypothesis was proposed as an explanation for the poor lie detection performance and stereotypical beliefs of presumed experts on lying (DePaulo & Pfeifer, 1986). The feedback hypothesis suggests that mere experience is inadequate for improving lie detection performance; for an improvement to occur, immediate, reliable and frequent outcome feedback on the veracity judgments is necessary (Einhorn, 1982; Hogarth, 2001). It has been suggested that one group who receive more feedback is criminals (Vrij & Semin, 1996). Hence, they may be equipped with more correct beliefs about indicators to deception. Indeed, the results showed that prison inmates held less stereotypical beliefs about cues to deception, and the feedback hypothesis can be seen as a post-hoc explanation for these results.

However, it is important to note that the feedback hypothesis is only one of several explanations for the less stereotypical beliefs about deception held by the prison inmates. For example, it is possible that individual differences between prison inmates and the two other groups may account for the differences in beliefs about deception. Moreover, it might be that some aspect in the environment of criminals other than feedback gives rise to the less stereotypical beliefs about deception held by the prison inmates in this study.

Little research has been carried out on the issue of the deceptive behaviour of criminals. It might be the case that the prison inmates held different beliefs about cues to deception than did prison personnel and lay people because the objective cues to deception identified in the research literature were not applicable to criminals. However, research indicates that criminals' behaviour while lying is similar to that of non-criminals (Mann, Vrij, & Bull, 2002). In a recent study (Vrij & Mann, 2001), the nonverbal behaviour of a suspect (later convicted of murder) during police questioning was examined. Importantly, results from this study showed that the cues to deception exhibited by the offender match those observed in research on the nonverbal behaviour of nonoffenders, but more research on this issue is needed.

Within-group agreement

The important finding of the within-group analyses was that the level of disagreement within each of the investigated groups was high. Prison inmates did not reach consensus on any item, whereas prison personnel and students agreed on only one item. The lack of agreement within the prison inmate group can be taken as indirect support for our prediction that the prison inmates would hold less stereotypical beliefs about deception, because their beliefs on a group level were more heterogeneous than the beliefs of the other two groups.

Methodological considerations

A limitation of this study is that the participants did not get the chance to express the beliefs about cues to deception that they themselves considered important. It might be the case that the items included in this study did not represent the cues that the participants actually use when faced with the task of assessing veracity. A different approach would have been to ask participants to freely report cues to deception and how they use these cues when assessing veracity. However, such a method would make group comparisons more difficult. Another method would have been to analyse cues reported in connection to a veracity judgment, as it is possible that one reports different cues in connection with an actual veracity judgment than when not facing such a task. Interestingly, results from a recent study on criminals' ability to detect deception (Hartwig, Granhag, Strömwall, & Andersson, 2004) show a rather high degree of correspondence between the beliefs reported in the present study and cues reported in connection to an actual veracity judgment. For example, the prison inmates in the present study did not express very much faith in the consistency cue, this belief differed from that of prison personnel and students who believed consistency to be related to deception. In the study by Hartwig *et al.* (2004), consistency was the most frequently mentioned cues for students, whereas it was very seldomly mentioned by prison inmates.

Conclusions

Differences in beliefs about deception between the groups were found on six of the eleven items. For five of these, it was the prison inmates who differed from the prison personnel and students. Comparing the beliefs with objective cues to deception, it seems as if the prison inmates had more insight into the psychology of deception than the two other groups. However, this is not to say that prison inmates did not at all hold stereotypical beliefs about cues to deception. At a general level, the findings from this study are in line with results from the study by Vrij and Semin (1996), but the present study extends the scope by including items concerning not only nonverbal behaviour but also verbal behaviour and strategies for deceiving.

It is important to distinguish between holding accurate beliefs and making accurate judgments. Even though criminals hold less stereotypical beliefs about cues to deception, we cannot draw the conclusion from this finding alone that they will perform better when facing the task of assessing veracity. In order to investigate whether the less stereotypical beliefs of criminals are helpful when judging veracity, studies exploring the lie-detection skills of criminals need to be conducted. Results from one such study showed that criminals did indeed achieve an accuracy level in detecting lies significantly higher than chance, whereas students did not (Hartwig *et al.*, 2004).

Taken together, it seems criminals possess a certain degree of expertise in the area of deception. We believe that studying these 'real experts' can generate important

knowledge about the dynamics of deception. Ideally, this knowledge could be used in a constructive way to train professionals in detecting deception.

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References

- Akehurst, L., Köhnken, G., Vrij, A., & Bull, R. (1996). Lay persons' and police officers' beliefs regarding deceptive behaviour. *Applied Cognitive Psychology, 10*, 461–471.
- Allwood, C. M., & Granhag, P. A. (1999). Feelings of confidence and the realism of confidence judgments in everyday life. In P. Juslin & H. Montgomery (Eds.), *Judgment and decision making: Neo-Brunswikian and process-tracing approaches* (pp. 123–146). Mahwah, NJ: Erlbaum.
- DePaulo, B. M. (1992). Nonverbal behavior and self-presentation. *Psychological Bulletin, 111*, 203–243.
- DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin, 129*, 74–112.
- DePaulo, B. M., & Pfeifer, R. L. (1986). On-the-job experience and skill at detecting deception. *Journal of Applied Social Psychology, 16*, 249–267.
- Einhorn, H. J. (1982). Learning from experience and suboptimal rules in decision making. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (pp. 268–283). Cambridge: Cambridge University Press.
- Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist, 46*, 913–920.
- Granhag, P. A., & Strömwall, L. A. (2002). Repeated interrogations: Verbal and nonverbal cues to deception. *Applied Cognitive Psychology, 16*, 243–257.
- Granhag, P. A., Strömwall, L. A., & Hartwig, M. (2003). *Granting asylum or not? Migration Board personnel's beliefs about deception*. Manuscript submitted for publication.
- Granhag, P. A., Strömwall, L. A., & Jonsson, A.-C. (2003). Partners in crime: How liars in collusion betray themselves. *Journal of Applied Social Psychology, 33*, 848–867.
- Greuel, L. (1992). Police officers' beliefs about cues associated with deception in rape cases. In F. Lösel, D. Bender, & T. Bliesener (Eds.), *Psychology and law - International perspectives* (pp. 234–239). Berlin: de Gruyter.
- Hartwig, M., Granhag, P. A., Strömwall, L. A., & Andersson, L. O. (2004). Suspicious minds: Criminals' ability to detect deception. *Psychology, Crime, and Law, 10*, 83–95.
- Hogarth, R. M. (2001). *Educating intuition*. Chicago: University of Chicago Press.
- Kassin, S. M., Ellsworth, P. C., & Smith, V. L. (1989). The general acceptance of psychological research on eyewitness testimony: A survey of the experts. *American Psychologist, 44*, 1089–1098.
- Kraut, R. E. (1980). Humans as lie detectors: Some second thoughts. *Journal of Communication, 30*, 209–216.
- Mann, S., Vrij, A., & Bull, R. (2002). Suspects, lies, and videotape: An analysis of authentic high-stake liars. *Law and Human Behavior, 26*, 365–387.
- McCornack, S. A. (1997). The generation of deceptive messages: Laying the groundwork for a viable theory of interpersonal deception. In J. G. Greene (Ed.), *Message production: Advances in communication theory* (pp. 91–126). Mahwah, NJ: Erlbaum.
- Nevid, J. S. (2003). *Psychology: Concepts and applications*. Boston: Houghton Mifflin.
- Norwick, R. J., Kassin, S. A., Meissner, C. A., & Malpass, R. L. (2002, March). *'I'd know a false confession if I saw one': A comparative study of college students and police*

- investigators*. Paper presented at the Biennial Meeting of the American Psychology-Law Society in Austin, Texas.
- Porter, S., Woodworth, M., & Birt, A. R. (2000). Truth, lies and videotape: An investigation of the ability of federal parole officers to detect deception. *Law and Human Behavior, 24*, 643-658.
- Sporer, S. L., & Schwandt, B. (2002, March). *Nonverbal indicators of deception: A meta-analytic synthesis*. Paper presented at the Biennial Meeting of the American Psychology-Law Society in Austin, Texas.
- Stiff, J. B., Miller, G. R., Sleight, C., Mongeau, P., Garlick, R., & Rogan, R. (1989). Explanations for visual cue primacy in judgments of honesty and deceit. *Journal of Personality and Social Psychology, 56*, 555-564.
- Strömwall, L. A., & Granhag, P. A. (2003). How to detect deception? Arresting the beliefs of police officers, prosecutors and judges. *Psychology, Crime and Law, 9*, 19-36.
- Vrij, A. (1998). Nonverbal communication and credibility. In A. Memon, A. Vrij, & R. Bull (Eds.), *Psychology and law. Truthfulness, accuracy and credibility* (pp. 32-58). Cambridge: McGraw-Hill.
- Vrij, A. (2000). *Detecting lies and deceit: The psychology of lying and its implications for professional practice*. Chichester: Wiley.
- Vrij, A., Edward, K., & Bull, R. (2001). Police officers' ability to detect deceit: The benefit of indirect deception detection measures. *Legal and Criminological Psychology, 6*, 185-196.
- Vrij, A., & Mann, S. (2001). Telling and detecting lies in a high-stake situation: The case of a convicted murderer. *Applied Cognitive Psychology, 15*, 187-203.
- Vrij, A., & Semin, G. R. (1996). Lie experts' beliefs about nonverbal indicators of deception. *Journal of Nonverbal Behavior, 20*, 56-80.
- Vrij, A., & Taylor, R. (2003). Police officers' and students' beliefs about telling and detecting trivial and serious lies. *International Journal of Police Science and Management, 5*, 1-9.
- Zuckerman, M., DePaulo, B. M., & Rosenthal, R. (1981). Verbal and nonverbal communication of deception. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 14, pp. 1-57). New York: Academic Press.
- Zuckerman, M., Koestner, R., & Alton, A. O. (1984). Learning to detect deception. *Journal of Personality and Social Psychology, 46*, 519-528.

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